

What is claimed is:

1. An implantable therapy delivery and / or diagnostic device, comprising:
a fixation element adapted to secure the device to an implant site;
one or more elongate conductors extending within the device;
a polymeric layer overlaying a portion of the device in proximity to the implant site and including an outer surface; and
a layer of a catalytic agent, having nitrite reductase and / or nitrate reductase, or nitrosothiol reductase activity, present on the outer surface of the polymeric layer;
wherein the catalytic layer converts nitrite/nitrate or nitrosothiols to nitric oxide when in contact with blood.
2. The device of claim 1 wherein the polymeric layer is formed of a material selected from the group consisting of silicone, polyurethane, PTFE and expanded PTFE.
3. The device of claim 1, wherein the polymeric layer further includes a bulk matrix containing a reservoir of lipophilic salts or nitrite/nitrate or nitrosothiols that can leak to the layer of catalytic agent.
4. The device of claim 1, further comprising an elongate body, which carries the one or more conductors, and wherein the polymeric layer forms the device body.
5. The device of claim 4, wherein the polymeric layer is a multilumen tube.
6. The device of claim 4, further comprising a coil electrode coupled to a one of the one or more conductors and overlaying the outer surface of the polymeric layer; wherein the one of the one or more conductors includes an electrically conductive wire.

7. The device of claim 4, further comprising a coil electrode coupled to a one of the one or more conductors and partially imbedded in the outer surface of the polymeric layer; wherein the one of the one or more conductors includes an electrically conductive wire.

8. The device of claim 1, further comprising an elongate body, which carries the one or more conductors, and wherein the polymeric layer overlays the device body.

9. The device of claim 8, wherein the device body is a multilumen tube.

10. The device of claim 8, further comprising a coil electrode coupled to a one of the one or more conductors and overlaying the outer surface of the polymeric layer; wherein the one of the one or more conductors includes an electrically conductive wire.

11. The device of claim 8, further comprising a coil electrode coupled to a one of the one or more conductors and partially embedded in the outer surface of the polymeric layer; wherein the one of the one or more conductors includes an electrically conductive wire.

12. The device of claim 8, wherein the polymeric layer includes a plurality of pores extending therethrough and the device body contains a reservoir of lipophilic salts or nitrite / nitrate or nitrosothiols which can leak to the layer of catalytic agent.

13. The device of claim 8, further comprising a coil electrode coupled to a one of the one or more conductors and overlaying the device body; wherein the one of the one or more conductors includes an electrically conductive wire

and wherein the polymeric layer extends over the coil electrode and allows electrical conduction therethrough.

14. The device of claim 8, wherein the polymeric layer further includes a bulk matrix containing a reservoir of lipophilic salts or nitrite/nitrate or nitrosothiols that can leak to the layer of catalytic agent.

15. The device of claim 1, further comprising:
a physiological sensor capsule coupled to the one or more conductors;
wherein the outer surface of the polymeric layer overlays a portion of the sensor capsule; and
the one or more conductors includes an electrically conductive wire.

16. The device of claim 1, further comprising a polymeric plug held within the polymeric layer, the polymeric plug containing a reservoir of lipophilic salts or nitrite/nitrate or nitrosothiols that can leak to the layer of catalytic agent.

17. The device of claim 1, further comprising:
a distal tip electrode coupled to a one of the one or more conductors and adapted to stimulate the implant site;
a polymeric plug held within the polymeric layer and containing a reservoir of lipophilic salts or nitrite/nitrate or nitrosothiols that can leak to the layer of catalytic agent;
wherein the layer of catalytic agent is positioned in close proximity to the tip electrode; and
the one of the one or more conductors includes an electrically conductive wire.

18. The device of claim 17, wherein the polymeric plug is formed of a material selected from the group consisting of silicone and polyurethane.

19. The device of claim 1, wherein the catalytic agent comprises a biocatalytic agent.
20. The device of claim 1, wherein the catalytic agent comprises a biomimetic catalytic agent.
21. The device of claim 20, wherein the biomimetic catalytic agent comprises a Cu(II) metal ion ligand complex.
22. An implantable medical electrical lead comprising:
a distal fixation element adapted to secure the medical electrical lead to an implant site;
one or more elongate electrical conductors;
an electrode coupled to a one of the one or more conductors, adapted to stimulate in proximity to the implant site and including an outer surface; and
a layer of a catalytic agent, having nitrite reductase and / or nitrate reductase, or nitrosothiol reductase activity, attached to the outer surface of the electrode;
wherein the catalytic layer converts nitrite/nitrate or nitrosothiols to nitric oxide when in contact with blood
23. The lead of claim 22, wherein the electrode further includes a porous side wall and further comprising a polymeric plug held within the electrode side wall; the plug containing a reservoir of lipophilic salts or nitrite/nitrate or nitrosothiols that can leak through the porous sidewall to the layer of catalytic agent.
24. The lead of claim 23, wherein the polymeric plug is formed of a material selected from the group consisting of silicone and polyurethane.

25. The lead of claim 22, wherein the catalytic agent comprises a metal ion ligand complex.
26. The lead of claim 22, further comprising a porous layer overlaying the layer of catalytic agent.
27. An implantable therapy delivery and / or diagnostic device comprising:
a body including a sidewall having a plurality of pores;
a plug held within the porous sidewall and including a layer of catalytic agent, having nitrite reductase and / or nitrate reductase, or nitrosothiol reductase activity present on an outer surface of the plug;
wherein the catalytic layer, exposed to blood through the plurality of pores, converts nitrite/nitrate or nitrosothiols to nitric oxide when in contact with the blood.